

The Primary Pattern Generator

Introduction

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The need for a new, high-speed pattern generator capable of producing the more complex and precise circuit patterns required in the 1970s has already been discussed.¹ This paper describes the design and operation of the Primary Pattern Generator (PPG) in some detail. For the convenience of the reader, the paper has been separated into four parts. Part I covers the optical design of the machine, including the considerations which led to the choice of an argon laser light source, a recording emulsion, and an optimum combination of spot size and brightness. The original choice of a mechanically scanned system was made on the premise that, with such an approach, the required accuracy could be built in and retained over many years of operation, and Part II discusses the principal considerations behind this premise. In that paper are discussed the dimensional stability of the structural materials and their use in an extremely stiff structure, the features provided to align the parts of the system to the required tolerances, and the design of drive systems, essentially free from both vibration and wear. The control of the machine to produce the pattern encoded on the input tape is discussed in Part III; Part IV deals with the methods used to align the assembled machine and details the pattern accuracy and reproducibility which was achieved.

The PPG, a highly automated system requiring operator action at very few points in the cycle, is part of an overall system running under computer scheduling. Operator acceptance of the system has been excellent, perhaps due to the incorporation of status displays beyond the essential minimum including a real-time display of the pattern being produced.

REFERENCE

1. Howland, F. L., and Poole, K. M., "An Overview of the New Mask-Making System," B.S.T.J., this issue, pp. 1997-2009.

